F·A·A·M facility for airborne atmospheric measurements

FLIGHT FOLDER

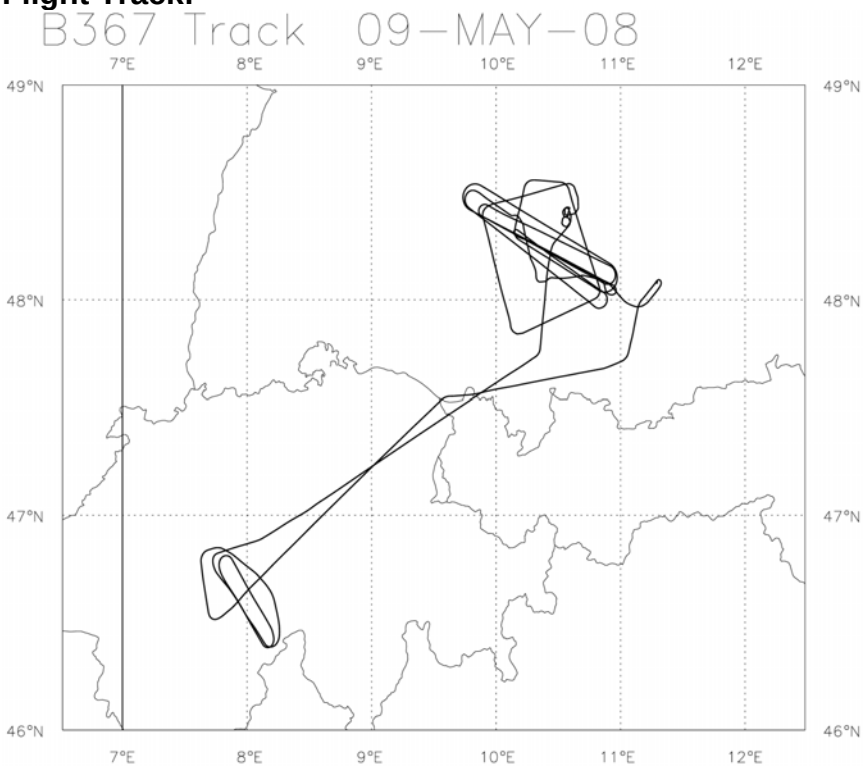
Flight No.	B367
Date:	09 May 2008
Take Off:	12:23:19Z
Landing:	16:50:21Z
Flight Time	4h 27

Campaign: EUCAARI

Operating Area: ATR+Falcon intercomp +Jungfraujoch

POB	Position	Name	Institute	Logs y/n
1	Captain	Alan Foster	Directflight	
2	Co-pilot	Latti Lathouwers	Directflight	
3	CCM1	Dawn Quinn	Directflight	
4	Mission Scientist 1	Megan Northway	University of Reading	
5	Flight Manager	Alan Woolley	FAAM	
6	CCN / CCM2	Jamie Trembath	FAAM	
7	Cloud Physics	Jim Crawford	FAAM	
8	Wet & Dry Neph / PSAP / Filters / CVI	James Bowles	Met Office	
9	SWS	Debbie O'Sullivan	Met Office	
10	AMS	Will Morgan	University of Manchester	
11	2D-S / CAPS / CPI	Dantong Liu	University of Manchester	
12	PAN / TDLAS / Core Chem	Jim McQuaid	FAAM	
13	Mission Scientist 2	Hugh Coe	University of Manchester	
14	CPI rack 2	Ian Crawford	University of Manchester	
15	Mission 3	Efstratios Bourtsoukidis	Thessaloniki University	

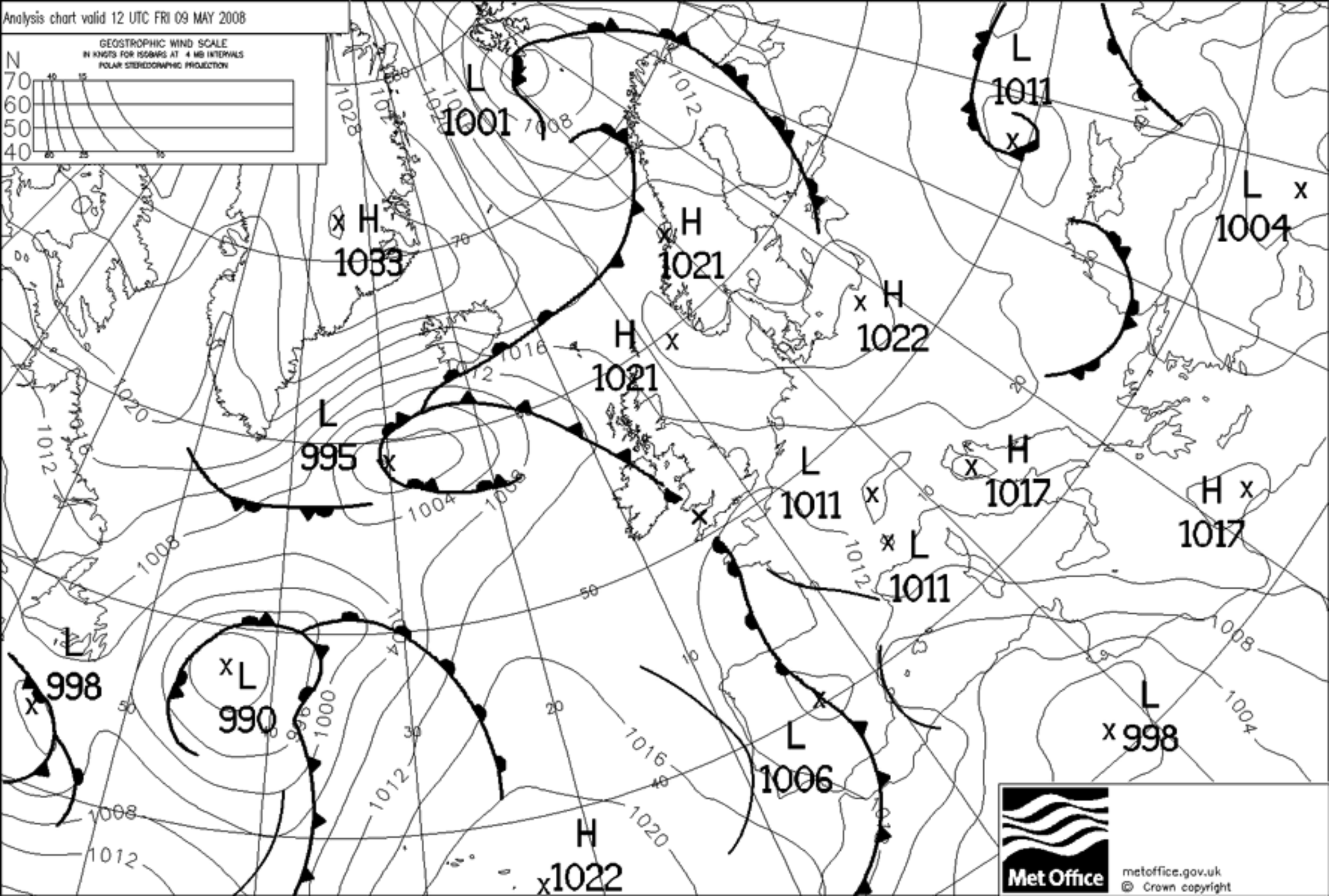
Flight Track:



FLIGHT SUMMARY

Flight No B367
Date: 9/5/08
Project: EUCAARI
Location: Intercomparison and Junfraujoch

Start Time	End Time	Event	Height (s)	Hdg	Comments
121328		taxy	1.8 kft	359	
121856	122128	Pirouette 1	1.8 kft	359	
122359		T/O	1.8 kft	359	from oberpfaffenhofen
123427		jw nevz zero	9.0 kft	359	
123957	124919	Run 1	3.9 kft	359	ATR to port
124519		lwr bbr	3.9 kft	359	exposed
125149	125636	Profile 1	4.0 - 9.0 kft	359	ATR to stbd, 180kts flap 18
125636	130459	Run 2	9.0 kft	359	ATR to stbd
130727	131037	Run 3	9.0 kft	359	ATR to stbd
132447	133708	Run 4	3.9 - 4.0 kft	359	Falcon to stbd
133741	134545	Profile 2	4.0 - 12.0 kft	359	Falcon to stbd
134550	135049	Run 5	12.0 kft	359	Falcon to stbd
135321	135943	Run 6	12.0 kft	359	Falcon to stbd
135959	141213	Profile 3	12.0 - 16.9 kft	359	Falcon to stbd
141027		ozone vent	22.3 kft	359	capped around 20.8kft
141213	141836	Run 7	23.9 kft	359	Falcon to stbd
142214	142800	Run 8	23.9 kft	359	Falcon to Port
143512	144005	Run 9	24.0 kft	359	cross sun
144107	144605	Run 10	24.0 - 23.9 kft	359	up sun
144749	145343	Run 11	23.9 kft	359	cross sun
145511	150012	Run 12	24.0 - 23.9 kft	359	down sun
150248	150515	Orbit 1	24.0 - 23.8 kft	359	double orbit
150551	150721	Orbit 2	24.0 kft	359	
152834	153622	Profile 4	23.8 - 15.1 kft	359	
153831	154425	Run 13	15.1 kft	359	Track over JFJ
155100	155127	Profile 5	14.9 - 14.6 kft	359	
155346	155917	Run 14	14.6 kft	359	
155644		abeam	14.6 kft	359	Jungfraujoch
161023	161302	Run 15	19.1 kft	359	
165021		Land	1.9 kft	359	at Oberpfaffenhofen
165131	165443	Pirouette 2	1.9 kft	359	
165531		BBR Pir	1.8 kft	359	showed small dirt effect
170035		Shutdown	1.9 kft	359	


Analysis chart valid 12 UTC FRI 09 MAY 2008
GEOSTROPHIC WIND SCALE
IN KNOTS FOR ISOBARS AT 4 MB INTERVALS
POLAR STEREOGRAPHIC PROJECTION
N
70
60
50
40
L 1001
H 1033
H 1021
H 1021
H 1022
L 1011
L 995
L 1011
H 1017
H 1017
L 1004
L 998
L 990
L 1011
L 1006
L 998
H 1022
1028
1024
1020
1016
1012
1008
1004
1000
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992
988
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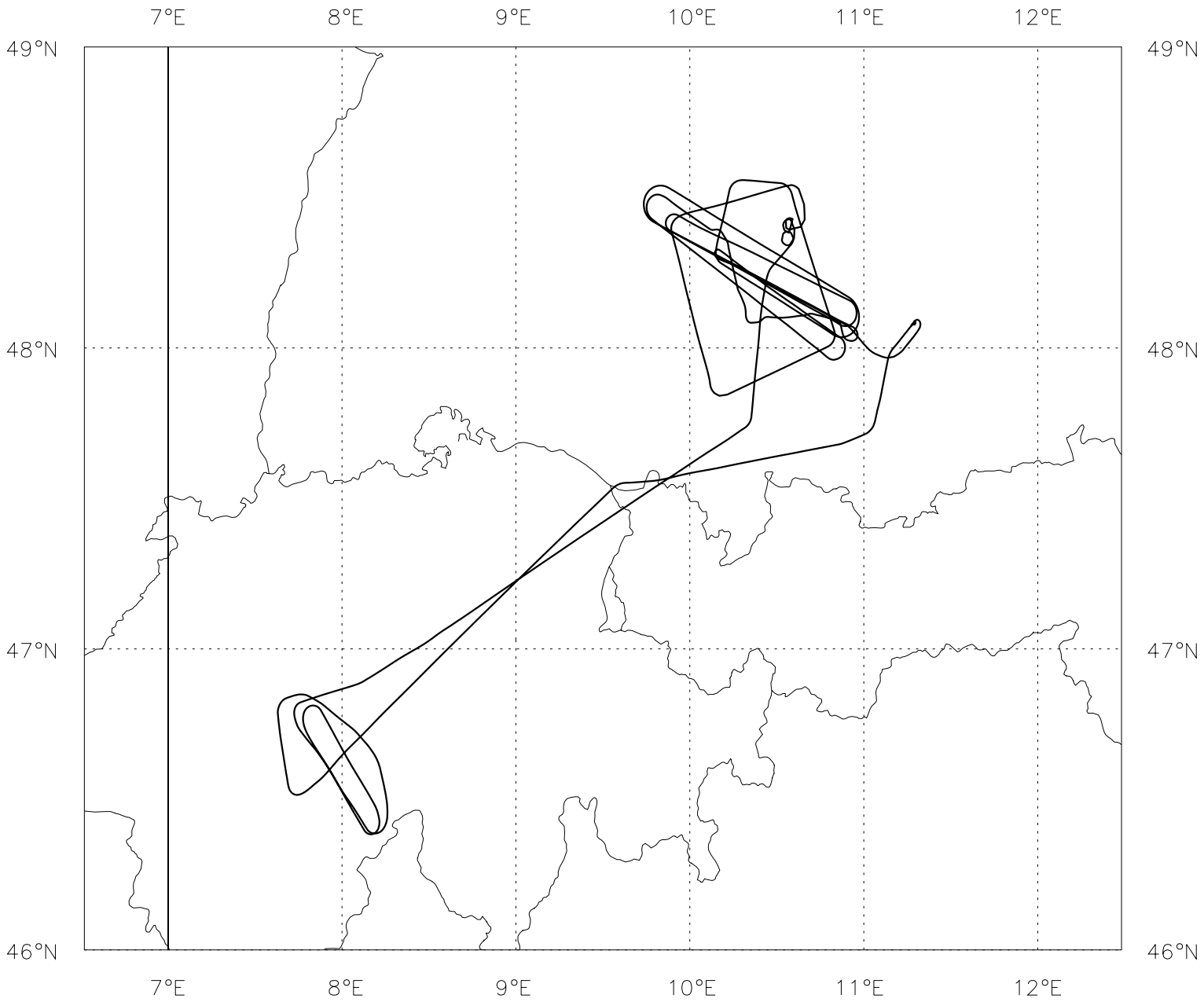
B367 Track 09-MAY-08



EUCAARI Flight B367 **Friday 10 May, 2008**
FAAM sortie brief

Intercomparison flight with ATR-42 SAFIRE, BAe-146 FAAM and DLR Falcon 20

1. Pilot 1 Alan Foster (DFL)
2. Pilot 2 Latty Lathouwers (DFL)
3. CCM Dawn Quinn (DFL)
4. Core Chemistry/PAN – Jim McQuaid (Leeds)
5. Flight Manager – Alan Wooley (FAAM)
6. CCM2/Cloud Physics – Jim Crawford (FAAM)
7. SWS – Debbie O'Sullivan (MO)
8. CPI rack – Dantong Liu (Manchester)
9. CPI rack 2 - Ian Crawford (Manchester)
10. Wet nephelometer/filters – James Bowles (MO)
11. AMS Rack – William Morgan (Manchester)
12. CCN – Steve Cowan (FAAM)
13. Mission Scientist – Hugh Coe (Manchester)
14. Mission Scientist 2 – Megan Northway (Reading)
15. Mission Scientist 3 – Efstratios Bourtsoukidis (Thessaloniki)

Other Comments:
Science Power on: 8:10Z (10:10 L)
Bae-146 Brief: 10:40Z (12:40L)
T/O: 12:10Z (14:10Z)

Operating Area: TRA Allgäu Box 207 and airspace below, Bernese Oberland local to Jungfraujoch

Sortie Objectives: 1) To inter-compare the three principle aircraft for the EUCAARI campaign: ATR-42 SAFIRE (F-HMTO), BAe-146 FAAM (G-LUXE) and DLR Falcon 20 (D-CMET). 2) To complete a high level box pattern and orbits for SWS/SHIMS calibration. 3) To sample pollution above the Aletsch glacier leading up to the Jungfraujoch that has been uplifted from the Po Valley.

Weather. High pressure centered over the N. Coast of Germany. Southerly winds across operating areas. Clear skies over central Europe with some possible convective cloud over Swiss/Italian Alps.

Flight patterns:

1. Given clear skies (no clouds to interfere with direct radiation) prior to take-off perform pirouette on the runway. (360 degree turn, at around 120 degrees per minute).

2. Take off Oberpfaffenhoffen at 1210Z (1410 local)

3. Transit to TRA Allgau Box 207 in position to join the SAFIRE ATR at FL90.

Intercomparison with French ATR:

4. 10 min SLR at FL90 in formation with ATR
5. Profile descent to 2000 ft A.G.L. at 1000 ft/min in formation with ATR
6. 10 min SLR at 2000 ft A.G.L. in formation with ATR

[30 min, T= 13:00Z]

Intercomparison with Falcon:

7. Hold at 2000 ft A.G.L. to wait for join with Falcon [T=13:10Z]
8. 10 min SLR at 2000 ft in formation with Falcon
9. Profile ascent at 1000 ft/min to FL120
10. 10 min SLR at FL120 in formation with Falcon
11. Profile ascent at 1000 ft/min to FL240
12. 10 min SLR at FL240 in formation with Falcon

[60 min, T= 14:10Z]

***Radiometer calibration*:**

13. Perform a box pattern at FL240 in Box 207. 2 x 5 minute legs across sun, 1 x 5 minute leg into and 1 x 5 minute leg down sun is ideal. Request "ok" from SWS operator before ending each leg. (Instructions for SWS operator: During the into and down-sun runs, the SWS should spend 30s each on views starting approximately 10 degrees off the solar zenith angle, then dwelling at 10 deg intervals moving away from the sun. The SWS should be pointed at zenith on the cross sun runs (corrected for pitch, i.e. 6 deg forward)).

14. At flight level FL240, perform 2 sets of 2 clockwise orbits. The first two should be at near solar zenith angle and the second 2 at zenith angle+10 degrees. The SWS should view zenith (corrected for aircraft pitch, i.e. forward 6 deg). Request "ok" from SWS operator before starting each orbit. Reduce to two orbits 10-20 degrees off solar zenith angle if time is limited.
(Instructions for SWS operator: On the first of each pair, the integration times to be as for a normal zenith view with the cycle time as fast as possible, on the second of each pair, the integration time to be reduced to a level that will not saturate or minimum (15ms), and the cycle time set to 0.1s.
[45 mins, T=14:55Z]

15. Transit to working area in Bernese Oberland south of the Jungfraujoch.

16. Conduct a series of SLRs up the Alletsch glacier at a series of altitudes as determined by the mission scientist [60 min, T=15:55Z]

17. Transit back to Oberpfaffenhoffen. [30 min]

18. Land Oberpfaffenhoffen (Total Flight time 4:05). [T=16:25Z]

19. Given clear skies (no clouds to interfere with direct radiation) prior to take-off perform pirouette on the runway. (360 degree turn, at around 120 degrees per minute).

Intercomparison exercise for ATR-42 SAFIRE, Bae-146 FAAM and DLR Falcon 20 using TRA Allgäu and airspace below

Date: 9 May 2008

ATR arrival to EDMO (from EHRD) approx. 07:30 UTC

Crew briefing (all three aircrafts) at DLR/Oberpfaffenhofen: 08:00 – 10:00 UTC

ATR-42 (F-HMTO) T/O EDMO:	11:35 UTC
DLR Falcon 20 (D-CMET) T/O EDMO:	11:40 UTC
FAAM BAe-146 (G-LUXE) T/O EDMO:	12:10 UTC

Meeting (Entry) point has to be decided with pilots and ATC as well as holding pattern for D-CMET from 12:20 UTC to 13:20 UTC

1st pair (D-CMET with F-HMTO)
Meeting point below TRA Allgäu at FL90: 11:50 UTC

1st leg, 190 KIAS	FL 90	11:55 - 12:05 UTC
2nd leg, 190 KIAS	2000 ft AGL	12:12 – 12:22 UTC

Descent rate between levels is **1000 ft/min**

D-CMET leaves to holding pattern at 12:22 UTC

2nd pair (G-LUXE with F-HMTO)
Approx. meeting point below TRA Allgäu at 2000 ft AGL: 12:25 UTC

1st leg, 190 KIAS	2000 ft AGL	12:30 - 12:40 UTC
2nd leg, 190 KIAS	FL 90	12:50 – 13:00 UTC

Climbing rate between levels is **1000 ft/min**

F-HTMO leaves TRA Allgäu at 13:05 UTC for return to EHRD

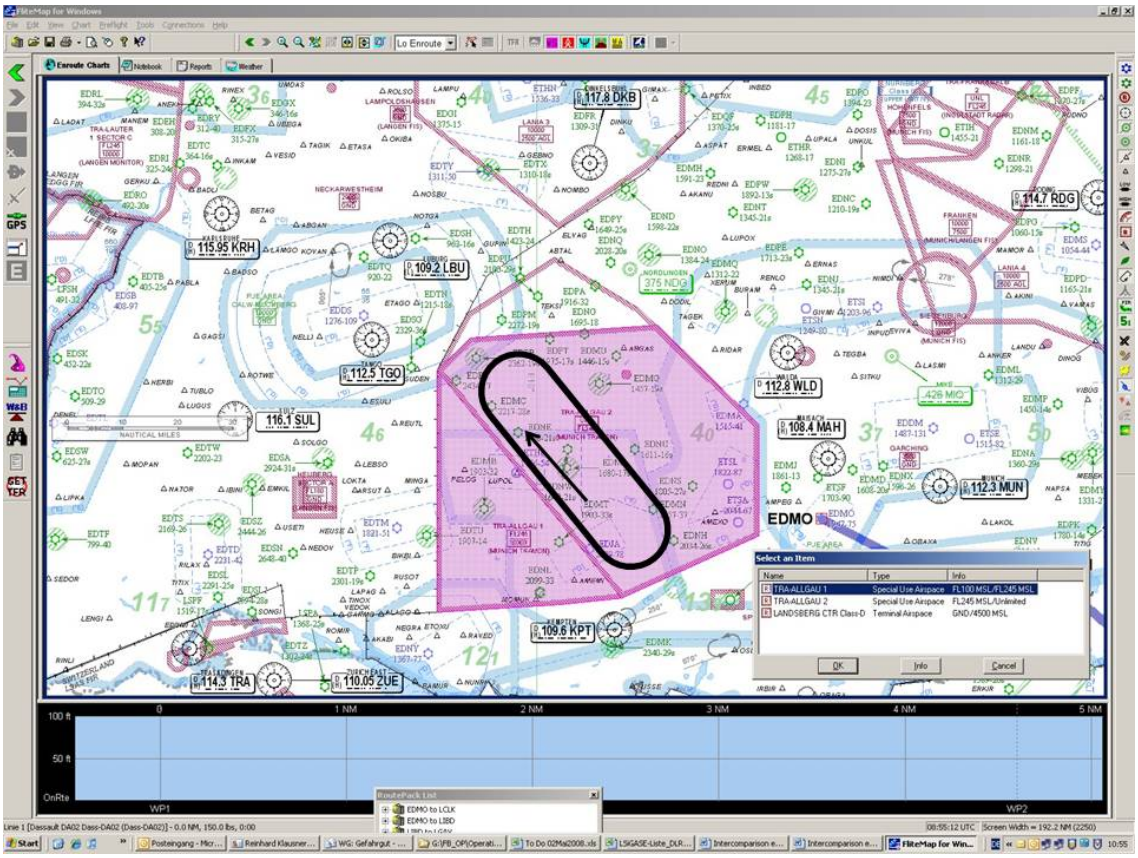
3rd pair (D-CMET with G-LUXE)
Approx. meeting point below TRA Allgäu at 2000 ft AGL: 13:10 UTC

1st leg, 200 KIAS	2000 ft AGL	13:15 - 13:25 UTC
3rd leg, 200 KIAS	FL 120	13:35 – 13:45 UTC
4th leg, 200 KIAS	FL 240	13:57 – 14:07 UTC

Climbing rate between levels is **1000 ft/min.**

D-CMET departs for EDMO at 14:10 UTC
G-LUXE departs towards calibration and Jungfraujoch at 14:10 UTC

D-CMET ETA to EDMO: 14:25 UTC
G-LUXE ETA to EDMO: 16:50 UTC



Suggested flight pattern for wing by wing comparison for each pair of airplanes.
Entry point into racetrack pattern for aircraft pairs to be defined by pilots/ATC
Holding pattern for G-LUXE during 2nd pair needs to be defined outside racetrack pattern by ATC.

Mission Scientist's Debrief Sheet

Flight B367 9th May 2008

Summary of the weather conditions:

Atlantic low positioned west of Iceland (978 mbar) and High over Denmark, extending North-South from Norway and into Germany. Anticyclonic flow in the region of Munich and the Allgau box. Clear skies and moderate aerosol amounts, with possible convective cloud conditions over Swiss/Italian Alps.

Points defined:

Allgau box 207
Jungfraujoch (46° 32' 51"N; 7° 59' 5.49"E)

Sortie objectives:
1) Intercomparison of the three pirncilple aircraft for the EUCAARI campaign: The SAFIRE ATR-42 (F-HMTO), the FAAM Bae-146 (G-LUXE), and the DLR Falcom (D-CMET). 2) To complete a high level box pattern and orbits for SWS/SHIMS and BBR calibrations, and 3) To sample pollution above the Aletsch Glacier leading up to the Jungfraujoch that has been uplifted from the Po Valley.

Summary of the flight:
A pirouette was performed on the runway before take-off and skies were clear. Initial ascent out of Oberpfaffenhofen indicated a well-mixed aerosol from the surface to 7000 ft.

Intercomparison:
The first half of the flight was a three aircraft intercomparison in the Allgau box region to the west of Oberpfaffenhofen. The DLR Falcon and the SAFIRE ATR42 had undertaken a comparison in advance of the BAe take off. The BAe joined the ATR at 2000' for a 12 minute run wingtip to wingtip with ATR on the port side of the BAe. During this run the ATR was not holding so steady and the two aircraft came quite close to one another. This was followed by a profile climb to 6700' with the ATR at port and an SLR and a short run at 6700'. Lastly two SLRs at 9000' with the ATR on the starboard side of the aircraft were completed. As formation was broken the wake of the ATR was sampled before heading down to 2000 ft to look for the Falcon.

The Bae joined the Falcon (on starboard) at 2000 ft after a short hunt for the aircraft. An SLR was commenced at 2000' a.g.l. This was followed by a profile climb in formation to FL120. A 10 minute run (interrupted for turn in formation) was completed with the Falcon on starboard at FL120. This was followed by a climb of both aircraft (in formation) to FL240. After a switch to put the Falcon at port a final run at FL240 was completed. The Falcon went directly ahead of the BAe as formation was broken.

Radiometer calibrations:
Once the comparison was complete a set of 5 minute box patterns was undertaken in clear skies to calibrate the radiometers and SWS at FL240. Two orbits at 55 ° bank were completed. This was completed successfully and no clouds were present.

Jungfraujoch work:
After this, the aircraft conducted a high level transit towards the Jungfraujoch. The aim of this section of the mission was to probe the predicted venting of pollution from Alpine valleys into the lower free troposphere.
A profile descent was carried out to 15,000' to the north side of the Jungfraujoch area and a straight and level run was conducted southward, overflying the JFJ supersite. A racetrack pattern was carried out with the northbound leg offset to the north-east. A second racetrack was conducted at 1450' over the same course. A venting was measured though some fantastic views were available and many photo

opportunities were grabbed. Some small Cu were seen and a straight and level run was undertaken to capture the venting air from the top of the Cu cloud. No evidence of venting from this cloud was observed. A profile ascent was undertaken and the aircraft recovered home. The predicted convective venting of pollution was not observed. After landing, a pirouette was performed on the runway showing a significant “dirty dip” in the upper BBR signals.

Instrument problems:
The SMPS was not working above FL120. No other instrument faults were reported.

Hugh Coe 14/5/08
and Megan Northway 17/5/08

Mission Scientist's Log

Flight No **B** 367 Date 9 May 2008 Name Megan Nolthway Page 1 of 3

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
12:18:56					pirouette on runway - OP
12:21:58					end of pirouette
					T/O oberpfaffenhofen
12:22					clear skies, no cirrus - a few
12:22					cumulus to the south west over Alps
12:37		8.6k			Neph aerosol well mixed to 7000 ft
					
1240					approached ~~Falcon~~ ATR
12:39:57	R1				Run w/ ATR at 2000 AGL (ATR on left)
12:51:49	P1				turn, climb to 9000 ft
12:53	R2	7600			run w/ ATR on right 9000 ft
					Alan asked Latty to drop back to
					take a photo
1305	R3	9000			-Short run at 9000 w/ ATR still on rt.
1320					aircraft w/ke from ~~ATR~~ Falcon
					profile to 2000 ft + look for
					ATR
13:20					Joining ~~ATR~~ Falcon (D-CMET)
13:24:42	R4	AGL 2150			run at 2000 agl ~~ATR~~ Falcon on right
1357:41	P2				
13:37:41	P2				profile climb to FL120
13:45:50	end P2 ~~start R5~~	FL120			run w/ Falcon at FL120
13:50:49	end R5	FL120			end of run, turn

Mission Scientist's Log

Flight No B.367. Date 9 May 2008 Name Megan Noelmway Page 2 of 3

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
13:53					SMPS stopped working (ucas working at lower altitudes)
135321	R6	FL120			Run at 120 w/ Falcon on right
	R6				end of run 6
					Start of profile climb to 240
1402	P3				Falcon slipping back on speed (185 knots)
14:13	P3				aerosol top height is at ~ 8 kft
					some cumulus over alps
14:12:14	ended P3	FL240	116		5 min run at 240 at this
14:12:14	Start R7				heading
14:15					47.67 solar zenith angle
					246.143 azimuth
14:18		FL240			move on turn with Falcon on
					left (port)
14:22:14	R8	FL240			Falcon wants to work in the
					area at 240 where we were going
					to do Box pattern
14:23					They will work at FL250
14:28:00					splitting formation - mission science changeover
	R9				azimuth 249 (into sun run)
14:4005					end of run 9 (into sun run)
14:41:07	R10				up sun
14:35:12	R11				cross sun
14:5511	R12				down sun

Mission Scientist's Log

Flight No **B**367 Date 9-May 2008 Name Megan Northway Page 3 of 3

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
150~~2:98~~1		240			orbit 1 – double orbit 2x orbits at 55° bank
					(Initially tried 60 – 1 thunk – didn't work)
150551		240			orbit 2
					transit to Jungfraujoch (ETA =
15:28:34	P~~5~~4	24,000 – 15,000			Profile down over Alps
15:32	p4	20,000			20,000 ft
	R13	150			run at 15000
15:38					Crossing waypoint 19
					end of run
					series of runs at 5000
15:45					low pollution so far, air quite
					dry. AMS < 1 ug/m³ BC low
					– inversion layer capping pollution –
16:50:31					going home. Land OP
165131		~~0~~	359		pirouette 2 start
165443		~~0~~			pirouette 2 end – strange
					looking – cloud in front?

CLOUD PHYSICS LOG Flight B367

Date: 09 may 08	Operator: JC	DRS Time:	DAU1 Time:	DAU2 Time:	DAU3 Time:	Aux1 Time:	Aux2 Time:	Page 1 of 1

G.M.T	PCASP		FFSSP	SID1	SID2	2D2-C		2D2-P		CIP25			CIP100			Habit	Remarks
	Conc/cc	Mean R	Block TX	Count	Count	Conc/L	Max size	Conc/m3	Max size	Conc m3	Max size	LWC	Conc m3	Max size	LWC		

CLOUD PHYSICS LOG Flight B367

Date: 09 may 08	Operator: JC	DRS Time:	DAU1 Time:	DAU2 Time:	DAU3 Time:	Aux1 Time:	Aux2 Time:	Page 2 of 2

G.M.T	PCASP		FFSSP	SID1	SID2	2D2-C		2D2-P		CIP25			CIP100			Habit	Remarks
	Conc/cc	Mean R	Block TX	Count	Count	Conc/L	Max size	Conc/m3	Max size	Conc m3	Max size	LWC	Conc m3	Max size	LWC		
130727	47		64	1		0	0										Start run 3
130900	48		64	1		0	0										
131034	56		64	1		0	0										End run 3
132445	1200		302	3		0	0										Start run 4
132600	1200		302	3		0	0										
132800	1000		326	3		0	0										
133000	900		326	3		0	0										
133200	800		333	3		0	0										
133400	980		333	3		0	0										
133600	900		333	3		0	0										
133800																	
	990		333	3		0	0										Fl40 end run 4 start profile
	830		333	3		0	0										Fl50
	650		333	3		0	0										Fl60
	234		333	1		0	0										Fl70
	34		333	1		0	0										Fl80
	30		333	1		0	0										Fl100
	32		333	1		0	0										Fl120 end profile
134550																	Start run 5
135000	25		333	1		0	0										End Run 5
135321																	Start run 6
135500	32		334	0		0	0										
140000	30		334	0		0	0										End run 6
																	Start profile 3
	20		334	0		0	0										Fl140
	12		334	0		0	0										Fl160
	7		335	0		0	0										Fl200
	5		335	0		0	0										Fl240
141210																	End profile 4, start run 7
141300	7		335	0		0	0										
141500	11		335	0		0	0										
141700	9		335	0		0	0										
141900	9		335	0		0	0										End run 7
142200	7		335	0		0	0										Start run 8
142400	11		335	0		0	0										
142600	6		335	0		0	0										
142800	4		335	0		0	0										End run 8

PCASP Reference Volts =	FFSSP Reference Volts =	2D2-C End element 1 voltage =	CIP25 End element 1 voltage =	CIP100 End element 1 voltage =
PCASP Flow rate =		2D2-C End element 32 voltage =	CIP25 End element 64 voltage =	CIP100 End element 64 voltage =
	SID2 Laser power =	2D2-P End element 1 voltage =		

CLOUD PHYSICS LOG Flight B367

Date: 09 may 08	Operator: JC	DRS Time:	DAU1 Time:	DAU2 Time:	DAU3 Time:	Aux1 Time:	Aux2 Time:	Page 3 of 3

G.M.T	PCASP		FFSSP	SID1	SID2	2D2-C		2D2-P		CIP25			CIP100			Habit	Remarks
	Conc/cc	Mean R	Block TX	Count	Count	Conc/L	Max size	Conc/m3	Max size	Conc m3	Max size	LWC	Conc m3	Max size	LWC		
143500	15		335	0		0	0										Start run 9 (sws cross sun)
144000	8		337	0		0	0										End run 9
144110	7		337	0		0	0										Start run 10 (sws into sun)
144600	5		338	0		0	0										End run 10
144747	4		338	0		0	0										Start run 11
145200	5		338	0		0	0										End run 11
145500	4		338	0		0	0										Start run 12
150000	5		339	0		0	0										End run 12
152755																	End of transit
																	Start profile 4
	14		339	0		0	0										Fl230
	18		339	0		0	0										Fl200
	30		339	0		0	0										Fl150 end profile 4
153831	14		339	0		0	0										Start run 13
154000	10		339	0		0	0										
154500	9		339	0		0	0										End run 13
155353	10		339	0		0	0										Start run 14
155500	10		339	0		0	0										
155917	10		340	0		0	0										End run 14
161021	15		340	0		0	0										Start run 15
161300	30		340	0		0	0										End run 15
																	Transit return.

2dc triggering on return transit. Some particles but looks like noise. Sid not indicating anything
fl240 393 knots. Maybe speed induced.

PCASP Reference Volts =	FFSSP Reference Volts =	2D2-C End element 1 voltage =	CIP25 End element 1 voltage =	CIP100 End element 1 voltage =
PCASP Flow rate =		2D2-C End element 32 voltage =	CIP25 End element 64 voltage =	CIP100 End element 64 voltage =
© Met Office 2007	SID2 Laser power =	2D2-P End element 1 voltage =		

CLOUD PHYSICS PROCESSING LOG

Flight number: **B367** **T/O:**
Date of flight: 09/05/2008 **Land:**

A) **FFSSP PROCESSING** DONE IN EXETER		
Processing Stage	Done?	Comments
1) Transfer *.txt files from DVD to processing PC		
Bnnn_FFSSP_hh.txt for each hour of data Bnnn_FFSSP_HVMS.txt		**hh =** **Last sec processed =**
2) FTP the files (ascii) from the PC to directory PMSDATA: on FLOODS		**File size =**
3) FLOODS> **RUN MRFB:[PMS.FAST_FSSP]FSSP_EXTRACT_TAS** a) Flight number: **Bnnn** b) Path name: **MFDDATA:Bnnn_MFDX** c) Output directory: **PMSDATA:** d) Start time: *0 if unknown (see comment box)* e) End time: *240000 if unknown*		Use time just before/after take-off/landing. If T/O /landing just after/before the hour, ensure start/end time is before/after the hour if there is an FFSSP_hh.txt file for that hour.
4) FLOODS> **RUN MRFB:[PMS.FAST_FSSP]FFSSP_PROCESS_TXT** a) Flight number: **Bnnn** b) Directory: **PMSDATA:** c) TAS in processing: **Y** d) Vel threshold (clicks) **0** e) Calibration file: *Use the most recent calibration file.* Format FFSSP_CALddmmyyyy.txt Calibration files to be stored in MRFB:[PMS.FAST_FSSP] f) Adjust FFSSP time **Y/N** g) If Y, enter value to add to data time (seconds)		**Total glitches =** **Sec file written ok?** **Note calibration file used** Yes only if gross errors occur in FFSSP time eg; ~ 1hour
5) FLOODS> **WAVE** a) WAVE> **write_procffssp_to_m5,'pmsdata:Bnnn_procffssp.dat', 'mfddata:Bnnn_mfdX','pmsdata:Bnnn_m5procffssp',/auto** b) WAVE> **exit**		Use PVWAVE for this section **Note time correction applied to FFSSP by /auto =**
6) FLOODS> **MODIFY** a) Modifying datasets: **pmsdata:Bnnn_m5procffssp** b) Dataset: **mfddata:Bnnn_mfdX** c) New dataset: **mfddata:Bnnn_mfdY (y=x+1)** d) Parameter description file: *leave blank to use default*		**Input file size =** **M5 output file size =**
7) CHECKS: i). Are FFSSP and JW/Nevzorov LWC synchronized in time? *In flight_plot, parameters* *JW LWC para 535* *Nevzorov LWC para 602* *FFSSP LWC para 1202* ii). If not, repeat from step 5b replacing /auto with **addt=x** which adds x+20 secs to FFSSP time.		**Synchronized?**

CLOUD PHYSICS PROCESSING LOG

Flight number: B
Date of Flight:

B) 2D PROCESSING		REPROCESS +1hr
Processing Stage	Done?	Comments
1) Transfer Bnnn.dat file from CD/DVD to PC		
2) Zip up file on PC (Bnnn.zip)		
3) FTP the zipped file (binary) from the PC to the directory SEADAS_DATA:[SEADAS_DATA] on FLOODS		
4) Log on to FLOODS		
5) Unzip SEADAS_DATA:[SEADAS_DATA]Bnnn.zip		**Size of Bnnn.dat =**
6) FLOODS> **WAVE**		Use PVWAVE for this section
WAVE> **CONVERT_SEADAS_FILE** a) Input file: **SEADAS_DATA:[SEADAS_DATA]Bnnn.dat** b) Output file: **SEADAS_DATA:[SEADAS_DATA]Bnnn_seadas.dat** WAVE> **exit**		**Blocks read =** **Blocks written =** **Bad reads =**
7) FLOODS> **RUN MRFB:[PMS.SEADAS]READM200_FILE**		
a) Default directory: **PMSDATA:** b) Flight number: **Bnnn** c) Disk file name: **SEADAS_DATA:[SEADAS_DATA]Bnnn_seadas.dat** d) Comment string: e) Start time: *0 if unknown (T/O – 5 min)* f) End time: *240000 if unknown (Land + 5 min)* g) Read 2DC: **Y** h) Read 2DP: **Y** i) Secondary data: **Y** j) FSP-SYNC: **Y** k) cmd.str: **Y** l) Auto time correction: **N** m) Full length secondary:**N**		**Start =** **End =** Ignore error message scroll (vestigial error from tapes) **Are FRW, FSP, IMB, PCA,SEC files in PMSDATA? Are they non-zero in size?**
8) FLOODS> **WAVE**		2D image display and printing
i). WAVE> **imagedisplay** a) 2D directory name: **PMSDATA:** b) Flight number: **Bnnn** c) File generation no: **0** d) Time from IWC plot: **N** e) Select probe: (**1**) 2DC (**2**) 2DP f) Start time: *As in 7e above* g) End time: *As in 7f above* h) Time interval (sec): **5** recommended (0 for all images)		Must be done from FLOODS itself. **Note any problems with images** **2dc is noisy later on. 2dp is noise only and not processed**
ii). WAVE> **auto_image** a) 2D directory name: **PMSDATA:** b) Flight number: **Bnnn** c) Enter date: **YYYYMMDD** d) Enter start time: *0 if unknown (T/O – 1 min)* e) Enter end time: *240000 if unknown (Land – 1 min)* f) Enter time interval (sec) between successive imaged blocks: **10**		Prepare imagery for Core data From own PC again **Start = 0** **End =240000**
iii). WAVE> **exit** to create files		FAAM_YYYYMMDD_R0_ Bnnn_2Dx-images.ps
iv). FTP ascii *.PS files from PMSDATA: to PC		Notes on this in instructions
v). Load each into Ghostview or other pdf-converter		
vi). Output as pdf file (720 dpi resolution), appending name prefix of **CORE-CLOUD-PHY**_ to converted files		

9) FLOODS> **RUN MRFB:[PMS.SPEC2D.AUTO]PROCESS2D_AUTO**		NB. an error message may
a) Flight number: **Bnnn** b) Directory: **PMSDATA:** c) File generation: *Hit enter* d) Time correction: *Time offset of the 2D data* e) TAS: **Y** f) MFD directory: **MFDDATA:Bnnn_tas** g) Probe number: (**1**) 2DC (**2**) 2DP (**0**) Both *0 unless either probe known to be faulty* h) Start time: *0 if unknown (T/O + 30sec)* i) End time: *240000 if unknown (Land – 30sec)* j) Nominal averaging: **0.2** seconds for conversion to M5 k) Particle type 2DC: **8** if known to be in ice cloud **11** if known to be in water cloud l) Particle type 2DP: **8** if known to be in mixed-phase **8** if unknown m) Coefficient choice: **2** n) Output root filename: **PMSDATA:Bnnn_PROC2D**		appear, floating point exception, rerun and use time quoted in error message, repeat until successful. **X =** **Start =0** **End =**240000 **Time data processed to =** **2dproc files present?** *.2dc, *.2dp and *.dat
10) FLOODS> **WAVE**		Use PVWAVE for this section
i) WAVE> **WRITE_PROC2D_TO_M5, 'PMSDATA:BNNN_PROC2D.DAT', 'PMSDATA:BNNN_M5PROC2D'** ii). **exit**		Error message about HDDR file should be ignored. **Records =31**
11) FLOODS> **MODIFY**		
a) Modifying datasets: **pmsdata:Bnnn_m5proc2D** b) Datset: **mfddata:Bnnn_tas** c) New dataset: **mfddata:Bnnn_tas_2d** d) Parameter description file: leave blank to use default		**X =** **Y = (X+1)**
12) CHECKS:	N	
Are 2DC/2DP IWC of comparable magnitude and well-correlated with Nevzorov TWC? *In flight_plot, parameters* *Nevzerov TWC para 605* *2DC IWC para 1302* *2DP IWC para 1312*		**Use flight_plot to check data is present in mfd file?**

CLOUD PHYSICS PROCESSING LOG

Flight number: B367
Date of Flight:

C) PCASP PROCESSING		
Processing Stage	Done?	Comments
1) Complete stage 7) in 2D processing		
Ensures Bnnn_FSP.DAT containing raw PCASP data is written to directory PMSDATA:		
2) FLOODS> **RUN MRFB:[PMS.PCASP]PROCPCASP_NEW**		
a) Flight number: **Bnnn**		
b) File name: **PMSDATA:Bnnn_FSP.DAT**		
c) Root output name: **PMSDATA:Bnnn_PROCPCASP**		
Produces PMSDATA:Bnnn_PROCPCASP.DAT (binary)		
PMSDATA:Bnnn_PROCPCASP.OUT (ascii)		
d) Minimum size channel: *default = 1*		**Min size =1**
If smallest size channel are known to be noisy the value of the highest noise free channel to be entered here		
e) Calibration volume flow rate:		
Use the most recent value. (1.15ccs^{-1} Feb 07)		**Vol flow rate =** 0.65
*Calibration files to be stored in **Exeter***		
Entering zero gives default value = 1.0 cm^{3}s^{-1}		
f) Time correction: *Same value as used in 2D processing stage 9d*		
g) Start time: *0 if unknown*		
h) End time: *240000 if unknown*		
3) FLOODS> **WAVE**		Use PVWAVE for this section
i).WAVE> **write_procpcasp_to_m5, 'pmsdata:Bnnn_procpcasp.dat', 'pmsdata:Bnnn_m5procpcasp'**		
ii). WAVE> **exit**		
4) FLOODS> **MODIFY**		
a) Modifying datasets: **pmsdata:Bnnn_m5procpcasp**		
b) Dataset: **mfddata:Bnnn_tas_2d**		**X =**
c) New dataset: **mfddata:Bnnn_tas_2d_pcasp**		**Y = X+1 =**
d) Parameter description file: *leave blank to use default*		
5) CHECKS	**N**	
Are PCASP and JW peaks synchronous?		**Is data present in mfd?**
In flight_plot, parameters		Use flight_plot to check.
Neph – total blue scatter.		
PCASP conc para 1550		yes

P.S.A.P. Log

Flight No. **B**.367..... Date 9/05/08..... Page ..1 of .1.....

GMT	Filter Trans.	Flow Rate	B_a x 10^{-6}	Ph_det levels		Run	Remarks
Set to DRS time	New filter Tr = 1.000	Set to 3.0 lpm				(30s) ? Ave = s	←Preflight
123330	1	2.56	---	16	42	trans	
161643	.927	1.47	0	15	42	trans home	pump off.

B367_SWS_SHIMS_EventLog.txt

```
09:19:03.85  ---      -     -     -     -
09:19:03.86  ---      -     -     -     -  +++ SOFTWARE START/RESTART +++
09:19:03.86  ---      -     -     -     -  +++ hh:mm:ss.ff / Instr / Posn / Period /
tVIS/ tNIR / Comment +++
09:19:03.86  ---      -     -     -     -  +++ Flight no. B367
09:19:03.86  ---      -     -     -     -
09:19:06.53  SWS      -   100     -     -  Sample period changed from 250ms to 100ms.
09:19:09.61  USH      -   100     -     -  Sample period changed from 250ms to 100ms.
09:19:11.89  LSH      -   100     -     -  Sample period changed from 250ms to 100ms.
09:19:13.44  SWS      -     -     -     5  NIR int.time changed from 5ms to 5ms.
09:19:15.83  SWS      -     -     -     -  Telescope motor initialised.
09:19:20.65  SWS    0.0     -     -     -  Telescope sent to -6.000
09:19:21.20  SWS   -6.0     -     -     -  Telescope stopped.
09:19:29.67  SWS      -     -    50     -  VIS int.time changed from 5ms to 50ms.
09:19:29.68  SWS      -     -     -    50  NIR int.time changed from 5ms to 50ms.
09:19:30.86  USH      -     -     -     5  NIR int.time changed from 5ms to 5ms.
09:19:33.47  USH      -     -    50     -  VIS int.time changed from 5ms to 50ms.
09:19:33.48  USH      -     -     -    50  NIR int.time changed from 5ms to 50ms.
09:19:35.43  LSH      -     -     -     5  NIR int.time changed from 5ms to 5ms.
09:19:38.50  LSH      -     -   600     -  VIS int.time changed from 5ms to 600ms.
09:19:38.50  LSH      -     -     -   600  NIR int.time changed from 5ms to 600ms.
09:19:49.06  SWS      -     -     -     -  Initialization: VIS OK NIR OK
09:19:49.15  USH      -     -     -     -  Initialization: VIS OK NIR OK
09:19:49.24  LSH      -     -     -     -  Initialization: VIS OK NIR OK
09:19:56.23  SWS   -6.0     -     -     -  Telescope sent to 0.000
09:20:02.92  LSH      -     -     -     -  Manual scene recording started.
09:20:02.92  USH      -     -     -     -  Manual scene recording started.
09:20:02.93  SWS      -     -     -     -  Manual scene recording started.
09:20:10.21  ---      -     -     -     -  Reset shutters.
09:20:15.25  USH      -     -     -     -  Dark measurement started.
09:20:15.26  SWS      -     -     -     -  Dark measurement started.
09:20:15.31  LSH      -     -     -     -  Dark measurement started.
09:20:16.19  USH      -     -     -     -  Manual scene recording started.
09:20:16.39  SWS      -     -     -     -  Manual scene recording started.
09:20:22.09  LSH      -     -     -     -  Manual scene recording started.
09:20:30.78  USH      -     -     -     -  Dark measurement started.
09:20:30.86  SWS      -     -     -     -  Dark measurement started.
09:20:31.02  LSH      -     -     -     -  Dark measurement started.
09:20:31.76  USH      -     -     -     -  Manual scene recording started.
09:20:31.92  SWS      -     -     -     -  Manual scene recording started.
09:20:37.62  LSH      -     -     -     -  Manual scene recording started.
10:21:43.68  SWS      -     -     -     -  Dark measurement started.
10:21:44.61  SWS      -     -     -     -  Manual scene recording started.
10:21:53.93  USH      -     -     -     -  Idling
10:21:53.97  SWS      -     -     -     -  Idling
10:21:54.15  LSH      -     -     -     -  Idling
10:22:00.25  SWS      -     -     -     -  Manual scene recording started.
10:22:00.27  LSH      -     -     -     -  Manual scene recording started.
10:22:00.27  USH      -     -     -     -  Manual scene recording started.
10:25:11.18  SWS      -     -   600     -  VIS int.time changed from 50ms to 600ms.
10:25:11.19  SWS      -     -     -   600  NIR int.time changed from 50ms to 600ms.
10:25:13.11  SWS      -     -     -     -  Dark measurement started.
10:25:15.18  SWS      -     -     -     -  Manual scene sampling started - Not Recording!
10:25:18.54  USH      -     -     -     -  Idling
10:25:18.75  SWS      -     -     -     -  Idling
10:25:18.91  LSH      -     -     -     -  Idling
10:25:20.03  LSH      -     -     -     -  Manual scene recording started.
10:25:20.03  USH      -     -     -     -  Manual scene recording started.
10:25:20.03  SWS      -     -     -     -  Manual scene recording started.
10:25:23.51  USH      -     -     -     -  Dark measurement started.
10:25:23.73  SWS      -     -     -     -  Dark measurement started.
10:25:23.79  USH      -     -     -     -  Warning: Abnormally bright dark measurement.
10:25:23.96  LSH      -     -     -     -  Dark measurement started.
10:25:24.48  USH      -     -     -     -  Manual scene recording started.
10:25:24.80  LSH      -     -     -     -  Warning: Abnormally bright dark measurement.
10:25:30.20  SWS      -     -     -     -  Manual scene recording started.
10:25:30.42  LSH      -     -     -     -  Manual scene recording started.
```

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10:27:10.25  SWS   -0.0     -     -     -  Telescope sent to 174.000
10:27:11.93  SWS  173.9     -     -     -  Telescope stopped.
10:31:18.72  ---       -     -     -     -
10:31:18.72  ---       -     -     -     -  +++ SOFTWARE START/RESTART +++
10:31:18.72  ---       -     -     -     -  +++ hh:mm:ss.ff / Instr / Posn / Period /
tVIS/ tNIR / Comment +++
10:31:18.72  ---       -     -     -     -  +++ Flight no. B367
10:31:18.72  ---       -     -     -     -
10:31:34.22  SWS       -     -     -     -  Initialization: VIS OK NIR OK
10:31:34.31  USH       -     -     -     -  Initialization: VIS OK NIR OK
10:31:34.41  LSH       -     -     -     -  Initialization: VIS OK NIR OK
10:31:44.68  USH       -     -     -     -  Manual scene recording started.
10:31:44.68  LSH       -     -     -     -  Manual scene recording started.
10:31:44.69  SWS       -     -     -     -  Manual scene recording started.
10:31:49.49  SWS       -   100     -     -  Sample period changed from 250ms to 100ms.
10:31:51.51  SWS       -     -     -     5  NIR int.time changed from 5ms to 5ms.
10:31:53.73  SWS       -     -    50     -  VIS int.time changed from 5ms to 50ms.
10:31:53.74  SWS       -     -     -    50  NIR int.time changed from 5ms to 50ms.
10:31:55.73  USH       -     -     -     5  NIR int.time changed from 5ms to 5ms.
10:31:57.50  USH       -     -    50     -  VIS int.time changed from 5ms to 50ms.
10:31:57.50  USH       -     -     -    50  NIR int.time changed from 5ms to 50ms.
10:31:59.24  USH       -   100     -     -  Sample period changed from 250ms to 100ms.
10:32:00.49  LSH       -     -     -     5  NIR int.time changed from 5ms to 5ms.
10:32:02.62  LSH       -     -    45     -  VIS int.time changed from 5ms to 45ms.
10:32:02.63  LSH       -     -     -    45  NIR int.time changed from 5ms to 45ms.
10:32:05.88  LSH       -     -   600     -  VIS int.time changed from 45ms to 600ms.
10:32:05.89  LSH       -     -     -   600  NIR int.time changed from 45ms to 600ms.
10:32:07.41  LSH       -   100     -     -  Sample period changed from 250ms to 100ms.
10:32:14.00  SWS       -     -     -     -  Telescope motor initialised.
10:32:17.33  SWS       -     -     -     -  Telescope disabled.
10:32:33.25  SWS       -     -     -     -  Telescope motor initialised.
10:32:38.62  SWS     0.0     -     -     -  Telescope sent to -6.000
10:32:48.32  SWS    -6.0     -     -     -  Telescope sent to 0.000
10:32:50.82  SWS       -     -     -     -  Dark measurement started.
10:32:50.89  USH       -     -     -     -  Dark measurement started.
10:32:51.09  SWS       -     -     -     -  Warning: Abnormally bright dark measurement.
10:32:51.33  USH       -     -     -     -  Warning: Abnormally bright dark measurement.
10:32:51.33  LSH       -     -     -     -  Dark measurement started.
10:32:51.78  SWS       -     -     -     -  Manual scene recording started.
10:32:52.05  USH       -     -     -     -  Manual scene recording started.
10:32:52.18  LSH       -     -     -     -  Warning: Abnormally bright dark measurement.
10:32:56.35  ---       -     -     -     -  Reset shutters.
10:32:57.82  LSH       -     -     -     -  Manual scene recording started.
10:33:33.28  ---       -     -     -     -  Reset shutters.
10:33:38.05  USH       -     -     -     -  Dark measurement started.
10:33:38.07  LSH       -     -     -     -  Dark measurement started.
10:33:38.11  SWS       -     -     -     -  Dark measurement started.
10:33:39.02  USH       -     -     -     -  Manual scene recording started.
10:33:39.41  SWS       -     -     -     -  Manual scene recording started.
10:33:41.63  USH       -     -     -     -  Dark measurement started.
10:33:41.65  SWS       -     -     -     -  Dark measurement started.
10:33:42.58  USH       -     -     -     -  Manual scene recording started.
10:33:42.77  SWS       -     -     -     -  Manual scene recording started.
10:33:44.71  LSH       -     -     -     -  Manual scene recording started.
10:50:07.89  ---       -     -     -     -  Reset shutters.
10:50:12.70  USH       -     -     -     -  Dark measurement started.
10:50:12.75  SWS       -     -     -     -  Dark measurement started.
10:50:13.21  LSH       -     -     -     -  Dark measurement started.
10:50:13.65  USH       -     -     -     -  Manual scene recording started.
10:50:13.90  SWS       -     -     -     -  Manual scene recording started.
10:50:18.46  SWS       -     -     -     -  Dark measurement started.
10:50:18.48  USH       -     -     -     -  Dark measurement started.
10:50:19.42  SWS       -     -     -     -  Manual scene recording started.
10:50:19.59  USH       -     -     -     -  Manual scene recording started.
10:50:19.65  LSH       -     -     -     -  Manual scene recording started.
10:50:27.95  SWS       -     -     -     -  Dark measurement started.
10:50:28.02  USH       -     -     -     -  Dark measurement started.
10:50:28.12  LSH       -     -     -     -  Dark measurement started.
10:50:28.88  SWS       -     -     -     -  Manual scene recording started.
```

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10:50:29.08  USH      -     -     -     -  Manual scene recording started.
10:50:34.79  LSH      -     -     -     -  Manual scene recording started.
10:58:03.25  ---      -     -     -     -  Reset shutters.
10:58:06.47  USH      -     -     -     -  Dark measurement started.
10:58:06.52  SWS      -     -     -     -  Dark measurement started.
10:58:06.98  LSH      -     -     -     -  Dark measurement started.
10:58:07.44  USH      -     -     -     -  Manual scene recording started.
10:58:07.62  SWS      -     -     -     -  Manual scene recording started.
10:58:09.61  SWS      -     -     -     -  Dark measurement started.
10:58:09.66  USH      -     -     -     -  Dark measurement started.
10:58:10.58  SWS      -     -     -     -  Manual scene recording started.
10:58:10.75  USH      -     -     -     -  Manual scene recording started.
10:58:13.43  LSH      -     -     -     -  Manual scene recording started.
10:58:24.54  SWS      -     -     -     -  Dark measurement started.
10:58:24.61  USH      -     -     -     -  Dark measurement started.
10:58:24.85  LSH      -     -     -     -  Dark measurement started.
10:58:25.51  SWS      -     -     -     -  Manual scene recording started.
10:58:25.71  USH      -     -     -     -  Manual scene recording started.
10:58:31.38  LSH      -     -     -     -  Manual scene recording started.
11:13:11.75  SWS      -     -     -     -  Dark measurement started.
11:13:11.80  USH      -     -     -     -  Dark measurement started.
11:13:12.38  LSH      -     -     -     -  Dark measurement started.
11:13:12.72  SWS      -     -     -     -  Manual scene recording started.
11:13:12.90  USH      -     -     -     -  Manual scene recording started.
11:13:18.83  LSH      -     -     -     -  Manual scene recording started.
11:13:35.76  SWS      -     -     -     -  Dark measurement started.
11:13:36.70  SWS      -     -     -     -  Manual scene recording started.
11:13:37.43  USH      -     -     -     -  Dark measurement started.
11:13:38.39  USH      -     -     -     -  Manual scene recording started.
11:13:39.65  LSH      -     -     -     -  Dark measurement started.
11:13:46.11  LSH      -     -     -     -  Manual scene recording started.
11:25:03.06  ---      -     -     -     -  Reset shutters.
11:25:09.55  SWS      -     -     -     -  Dark measurement started.
11:25:09.56  USH      -     -     -     -  Dark measurement started.
11:25:09.84  LSH      -     -     -     -  Dark measurement started.
11:25:10.51  SWS      -     -     -     -  Manual scene recording started.
11:25:10.77  USH      -     -     -     -  Manual scene recording started.
11:25:16.41  LSH      -     -     -     -  Manual scene recording started.
11:25:18.28  SWS      -     -     -     -  Dark measurement started.
11:25:18.28  USH      -     -     -     -  Dark measurement started.
11:25:18.50  LSH      -     -     -     -  Dark measurement started.
11:25:19.23  SWS      -     -     -     -  Manual scene recording started.
11:25:19.43  USH      -     -     -     -  Manual scene recording started.
11:25:25.14  LSH      -     -     -     -  Manual scene recording started.
11:25:43.69  USH      -     -     -     -  Dark measurement started.
11:25:44.63  USH      -     -     -     -  Manual scene recording started.
11:25:45.92  LSH      -     -     -     -  Dark measurement started.
11:25:47.78  SWS      -     -     -     -  Dark measurement started.
11:25:48.72  SWS      -     -     -     -  Manual scene recording started.
11:25:52.40  LSH      -     -     -     -  Manual scene recording started.
11:25:52.73  ---      -     -     -     -  Reset shutters.
11:25:59.50  LSH      -     -     -     -  Dark measurement started.
11:25:59.51  SWS      -     -     -     -  Dark measurement started.
11:25:59.51  USH      -     -     -     -  Dark measurement started.
11:26:00.65  SWS      -     -     -     -  Manual scene recording started.
11:26:00.85  USH      -     -     -     -  Manual scene recording started.
11:26:04.30  USH      -     -     -     -  Dark measurement started.
11:26:04.40  SWS      -     -     -     -  Dark measurement started.
11:26:05.24  USH      -     -     -     -  Manual scene recording started.
11:26:05.45  SWS      -     -     -     -  Manual scene recording started.
11:26:05.94  LSH      -     -     -     -  Manual scene recording started.
11:28:41.16  ---      -     -     -     -  Reset shutters.
11:28:45.03  USH      -     -     -     -  Dark measurement started.
11:28:45.06  SWS      -     -     -     -  Dark measurement started.
11:28:45.13  LSH      -     -     -     -  Dark measurement started.
11:28:45.52  SWS      -     -     -     -  Dark measurement started.
11:28:46.01  USH      -     -     -     -  Manual scene recording started.
11:28:46.58  SWS      -     -     -     -  Idling
11:28:49.90  SWS      -     -     -     -  Manual scene recording started.
```

11:28:51.90	LSH	-	-	-	-	Manual scene recording started.
11:28:52.44	SWS	-	-	-	-	Dark measurement started.
11:28:53.39	SWS	-	-	-	-	Manual scene recording started.
11:28:56.70	USH	-	-	-	-	Dark measurement started.
11:28:57.65	USH	-	-	-	-	Manual scene recording started.
11:28:58.96	LSH	-	-	-	-	Dark measurement started.
11:29:05.39	LSH	-	-	-	-	Manual scene recording started.
11:46:20.29	---	-	-	-	-	*** cooler at -2 initially
11:46:32.54	---	-	-	-	-	*** no temp checks during take off
11:49:44.84	SWS	-	-	30	-	VIS int.time changed from 50ms to 30ms.
11:49:44.84	SWS	-	-	-	30	NIR int.time changed from 50ms to 30ms.
11:49:50.31	USH	-	-	30	-	VIS int.time changed from 50ms to 30ms.
11:49:50.32	USH	-	-	-	30	NIR int.time changed from 50ms to 30ms.
11:49:53.03	USH	-	-	-	-	Dark measurement started.
11:49:53.77	USH	-	-	-	-	Manual scene recording started.
11:49:54.55	SWS	-	-	-	-	Dark measurement started.
11:49:55.30	SWS	-	-	-	-	Manual scene recording started.
11:49:57.70	LSH	-	-	-	-	Dark measurement started.
11:50:00.00	USH	-	-	-	-	Dark measurement started.
11:50:00.77	USH	-	-	-	-	Manual scene recording started.
11:50:01.79	SWS	-	-	-	-	Dark measurement started.
11:50:02.54	SWS	-	-	-	-	Manual scene recording started.
11:50:04.19	LSH	-	-	-	-	Manual scene recording started.
11:50:35.30	SWS	0.0	-	-	-	Telescope sent to -6.000
11:50:39.53	SWS	-6.0	-	-	-	Telescope sent to -6.000
11:51:16.13	SWS	-6.0	-	-	-	Telescope sent to 40.000
11:51:18.88	SWS	-	-	-	-	Idling
11:51:18.90	USH	-	-	-	-	Idling
11:51:19.32	LSH	-	-	-	-	Idling
11:52:58.42	SWS	40.0	-	-	-	Telescope sent to -6.000
11:52:59.45	SWS	-6.0	-	-	-	Telescope sent to -6.000
11:53:06.58	SWS	-6.0	-	-	-	Telescope sent to 0.000
11:53:09.57	USH	-	-	-	-	Manual scene recording started.
11:53:09.58	LSH	-	-	-	-	Manual scene recording started.
11:53:09.58	SWS	-	-	-	-	Manual scene recording started.
11:56:52.30	---	-	-	-	-	*** cooler at -1 deg
11:57:02.02	---	-	-	-	-	Reset shutters.
12:06:51.43	---	-	-	-	-	Reset shutters.
12:06:56.76	SWS	-	-	-	-	Dark measurement started.
12:06:56.78	USH	-	-	-	-	Dark measurement started.
12:06:56.99	LSH	-	-	-	-	Dark measurement started.
12:06:57.53	SWS	-	-	-	-	Manual scene recording started.
12:06:57.78	USH	-	-	-	-	Manual scene recording started.
12:07:03.63	LSH	-	-	-	-	Manual scene recording started.
12:07:06.32	LSH	-	-	-	-	Dark measurement started.
12:07:06.35	USH	-	-	-	-	Dark measurement started.
12:07:06.44	SWS	-	-	-	-	Dark measurement started.
12:07:07.27	USH	-	-	-	-	Manual scene recording started.
12:07:07.51	SWS	-	-	-	-	Manual scene recording started.
12:07:12.78	LSH	-	-	-	-	Manual scene recording started.
12:12:22.50	SWS	0.0	-	-	-	Telescope sent to -0.500
12:12:26.94	---	-	-	-	-	Reset shutters.
12:12:30.75	USH	-	-	-	-	Dark measurement started.
12:12:30.76	SWS	-	-	-	-	Dark measurement started.
12:12:30.82	LSH	-	-	-	-	Dark measurement started.
12:12:31.53	USH	-	-	-	-	Manual scene recording started.
12:12:31.75	SWS	-	-	-	-	Manual scene recording started.
12:12:37.64	LSH	-	-	-	-	Manual scene recording started.
12:12:39.36	SWS	-	-	-	-	Dark measurement started.
12:12:39.39	USH	-	-	-	-	Dark measurement started.
12:12:39.74	LSH	-	-	-	-	Dark measurement started.
12:12:40.12	SWS	-	-	-	-	Manual scene recording started.
12:12:40.32	USH	-	-	-	-	Manual scene recording started.
12:12:46.22	LSH	-	-	-	-	Manual scene recording started.
12:15:59.34	---	-	-	-	-	*** cooler at 0
12:16:22.23	---	-	-	-	-	*** cooler at 1
12:18:34.94	---	-	-	-	-	*** cooler at 2 deg
12:18:57.64	---	-	-	-	-	*** atrt od p 1
12:19:15.77	---	-	-	-	-	*** sza 33.41 saa 210.25

```
12:21:28.70  ---      -     -     -     -  *** end of piroeutte 1
12:24:34.26  SWS      -     -     -     -  Warning: Clipping may be occurring.
12:31:44.92  ---      -     -     -     -  *** cooler at 1 deg
12:33:14.46  SWS      -     -    50     -  VIS int.time changed from 30ms to 50ms.
12:33:14.46  SWS      -     -     -    50  NIR int.time changed from 30ms to 50ms.
12:33:17.77  SWS      -     -     -     -  Dark measurement started.
12:33:18.72  SWS      -     -     -     -  Manual scene recording started.
12:33:20.59  SWS      -     -     -     -  Dark measurement started.
12:33:21.55  SWS      -     -     -     -  Manual scene recording started.
12:33:27.66  SWS   -0.5     -     -     -  Telescope sent to -6.500
12:33:31.71  ---      -     -     -     -  Reset shutters.
12:33:36.69  USH      -     -     -     -  Dark measurement started.
12:33:36.73  SWS      -     -     -     -  Dark measurement started.
12:33:36.92  LSH      -     -     -     -  Dark measurement started.
12:33:37.44  USH      -     -     -     -  Manual scene recording started.
12:33:37.88  SWS      -     -     -     -  Manual scene recording started.
12:33:43.58  LSH      -     -     -     -  Manual scene recording started.
12:33:46.26  USH      -     -     -     -  Dark measurement started.
12:33:46.27  SWS      -     -     -     -  Dark measurement started.
12:33:46.32  LSH      -     -     -     -  Dark measurement started.
12:33:47.05  USH      -     -     -     -  Manual scene recording started.
12:33:47.45  SWS      -     -     -     -  Manual scene recording started.
12:33:53.16  LSH      -     -     -     -  Manual scene recording started.
12:38:47.84  SWS      -     -     -     -  Warning: Clipping may be occurring.
12:39:33.07  ---      -     -     -     -  *** cooler at 0 deg
12:40:02.61  ---      -     -     -     -  *** start of run
12:40:32.65  ---      -     -     -     -  *** ATR on port side (left)
12:41:03.30  ---      -     -     -     -  Reset shutters.
12:41:08.42  USH      -     -     -     -  Dark measurement started.
12:41:08.48  SWS      -     -     -     -  Dark measurement started.
12:41:08.94  LSH      -     -     -     -  Dark measurement started.
12:41:09.20  USH      -     -     -     -  Manual scene recording started.
12:41:09.59  SWS      -     -     -     -  Manual scene recording started.
12:41:15.40  LSH      -     -     -     -  Manual scene recording started.
12:43:37.43  SWS      -     -     -     -  Idling
12:43:37.52  USH      -     -     -     -  Idling
12:43:37.59  USH      -     -     -     -  Idling
12:43:37.95  LSH      -     -     -     -  Idling
12:43:39.26  SWS   -6.5     -     -     -  Telescope sent to 173.500
12:43:40.97  SWS  172.3     -     -     -  Telescope stopped.
12:43:41.47  SWS      -     -     -     -  Manual scene recording started.
12:43:41.47  LSH      -     -     -     -  Manual scene recording started.
12:43:41.48  USH      -     -     -     -  Manual scene recording started.
12:45:16.35  SWS      -     -     -     -  Idling
12:45:16.41  USH      -     -     -     -  Idling
12:45:16.45  USH      -     -     -     -  Idling
12:45:16.67  LSH      -     -     -     -  Idling
12:45:18.66  SWS  173.5     -     -     -  Telescope sent to -6.500
12:45:20.34  SWS   -3.0     -     -     -  Telescope stopped.
12:45:21.06  USH      -     -     -     -  Manual scene recording started.
12:45:21.06  LSH      -     -     -     -  Manual scene recording started.
12:45:21.07  SWS      -     -     -     -  Manual scene recording started.
12:46:10.66  ---      -     -     -     -  *** cooler at -1
12:56:41.30  ---      -     -     -     -  *** second run
13:03:59.03  ---      -     -     -     -  Reset shutters.
13:04:04.16  USH      -     -     -     -  Dark measurement started.
13:04:04.18  SWS      -     -     -     -  Dark measurement started.
13:04:04.45  LSH      -     -     -     -  Dark measurement started.
13:04:05.00  USH      -     -     -     -  Manual scene recording started.
13:04:05.35  SWS      -     -     -     -  Manual scene recording started.
13:04:11.05  LSH      -     -     -     -  Manual scene recording started.
13:04:14.56  SWS      -     -     -     -  Dark measurement started.
13:04:14.57  USH      -     -     -     -  Dark measurement started.
13:04:15.00  LSH      -     -     -     -  Dark measurement started.
13:04:15.52  USH      -     -     -     -  Manual scene recording started.
13:04:15.59  SWS      -     -     -     -  Manual scene recording started.
13:04:21.45  LSH      -     -     -     -  Manual scene recording started.
13:21:45.31  SWS      -     -     -     -  Warning: Clipping may be occurring.
13:25:08.35  ---      -     -     -     -  *** start of run
```

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13:25:22.26  ---      -     -     -     -  *** run 4
13:27:06.52  SWS      -     -     -     -  Dark measurement started.
13:27:06.54  USH      -     -     -     -  Dark measurement started.
13:27:07.00  LSH      -     -     -     -  Dark measurement started.
13:27:07.47  USH      -     -     -     -  Manual scene recording started.
13:27:07.50  SWS      -     -     -     -  Manual scene recording started.
13:27:13.50  LSH      -     -     -     -  Manual scene recording started.
13:40:50.18  ---      -     -     -     -  Reset shutters.
13:40:54.84  SWS      -     -     -     -  Dark measurement started.
13:40:54.92  USH      -     -     -     -  Dark measurement started.
13:40:55.30  LSH      -     -     -     -  Dark measurement started.
13:40:55.83  SWS      -     -     -     -  Manual scene recording started.
13:40:55.89  USH      -     -     -     -  Manual scene recording started.
13:41:01.80  LSH      -     -     -     -  Manual scene recording started.
13:41:03.74  USH      -     -     -     -  Dark measurement started.
13:41:03.81  SWS      -     -     -     -  Dark measurement started.
13:41:03.88  LSH      -     -     -     -  Dark measurement started.
13:41:04.50  USH      -     -     -     -  Manual scene recording started.
13:41:04.95  SWS      -     -     -     -  Manual scene recording started.
13:41:10.65  LSH      -     -     -     -  Manual scene recording started.
13:41:15.40  SWS      -     -     -     -  Dark measurement started.
13:41:15.43  USH      -     -     -     -  Dark measurement started.
13:41:15.84  LSH      -     -     -     -  Dark measurement started.
13:41:16.39  USH      -     -     -     -  Manual scene recording started.
13:41:16.44  SWS      -     -     -     -  Manual scene recording started.
13:41:22.32  LSH      -     -     -     -  Manual scene recording started.
13:46:05.99  ---      -     -     -     -  *** end of profile 2 start of run 5
13:50:56.52  ---      -     -     -     -  *** end of run
13:57:41.28  ---      -     -     -     -  *** cooler still at -1 deg has been very
satble
13:57:50.46  SWS      -     -     -     -  Dark measurement started.
13:57:51.43  SWS      -     -     -     -  Manual scene recording started.
13:57:52.10  USH      -     -     -     -  Dark measurement started.
13:57:52.85  USH      -     -     -     -  Manual scene recording started.
13:57:53.92  LSH      -     -     -     -  Dark measurement started.
13:57:57.23  SWS      -     -     -     -  Dark measurement started.
13:57:58.20  SWS      -     -     -     -  Manual scene recording started.
13:57:58.91  USH      -     -     -     -  Dark measurement started.
13:57:59.70  USH      -     -     -     -  Manual scene recording started.
13:58:00.39  LSH      -     -     -     -  Manual scene recording started.
13:58:02.48  LSH      -     -     -     -  Dark measurement started.
13:58:08.94  LSH      -     -     -     -  Manual scene recording started.
14:09:49.10  SWS      -     -     -     -  Dark measurement started.
14:09:50.06  SWS      -     -     -     -  Manual scene recording started.
14:09:50.84  USH      -     -     -     -  Dark measurement started.
14:09:51.60  USH      -     -     -     -  Manual scene recording started.
14:09:53.32  LSH      -     -     -     -  Dark measurement started.
14:09:56.62  SWS      -     -     -     -  Dark measurement started.
14:09:57.59  SWS      -     -     -     -  Manual scene recording started.
14:09:58.57  USH      -     -     -     -  Dark measurement started.
14:09:59.33  USH      -     -     -     -  Manual scene recording started.
14:09:59.79  LSH      -     -     -     -  Manual scene recording started.
14:10:01.87  LSH      -     -     -     -  Dark measurement started.
14:10:08.31  LSH      -     -     -     -  Manual scene recording started.
14:12:15.09  ---      -     -     -     -  *** end of profile climb
14:12:23.69  ---      -     -     -     -  *** start of run
14:17:52.98  ---      -     -     -     -  *** turning and pointing down for recirocal
14:18:47.28  USH      -     -     -     -  Idling
14:18:47.33  SWS      -     -     -     -  Idling
14:18:47.84  LSH      -     -     -     -  Idling
14:18:50.52  SWS   -6.5     -     -     -  Telescope sent to 173.500
14:18:52.27  SWS  173.5     -     -     -  Telescope stopped.
14:18:53.88  USH      -     -     -     -  Manual scene recording started.
14:18:53.88  LSH      -     -     -     -  Manual scene recording started.
14:18:53.90  SWS      -     -     -     -  Manual scene recording started.
14:19:16.22  ---      -     -     -     -  *** run 8 (reciprocal of run 7)
14:27:11.19  ---      -     -     -     -  *** cooler still at -1
14:28:00.55  ---      -     -     -     -  *** end of run
14:28:03.78  SWS      -     -     -     -  Idling
```

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14:28:03.87  USH      -     -     -     -  Idling
14:28:04.08  LSH      -     -     -     -  Idling
14:28:05.84  SWS  173.5     -     -     -  Telescope sent to -6.500
14:28:07.61  SWS   -6.5     -     -     -  Telescope stopped.
14:28:08.80  USH      -     -     -     -  Manual scene recording started.
14:28:08.81  LSH      -     -     -     -  Manual scene recording started.
14:28:08.82  SWS      -     -     -     -  Manual scene recording started.
14:28:12.39  SWS      -     -     -     -  Dark measurement started.
14:28:13.35  SWS      -     -     -     -  Manual scene recording started.
14:28:13.82  USH      -     -     -     -  Dark measurement started.
14:28:14.61  USH      -     -     -     -  Manual scene recording started.
14:28:15.46  LSH      -     -     -     -  Dark measurement started.
14:28:18.14  SWS      -     -     -     -  Dark measurement started.
14:28:19.11  SWS      -     -     -     -  Manual scene recording started.
14:28:19.96  USH      -     -     -     -  Dark measurement started.
14:28:20.74  USH      -     -     -     -  Manual scene recording started.
14:28:21.94  LSH      -     -     -     -  Manual scene recording started.
14:28:23.40  LSH      -     -     -     -  Dark measurement started.
14:28:29.87  LSH      -     -     -     -  Manual scene recording started.
14:31:25.60  ---      -     -     -     -  *** about to start high level pattern
14:31:45.08  ---      -     -     -     -  *** look up timings from flight manager
14:32:07.14  ---      -     -     -     -  *** as will be busy checking sza and changing
viewing angle
14:32:17.38  SWS      -     -     -     -  Dark measurement started.
14:32:18.39  SWS      -     -     -     -  Manual scene recording started.
14:32:19.43  USH      -     -     -     -  Dark measurement started.
14:32:20.23  USH      -     -     -     -  Manual scene recording started.
14:32:21.27  LSH      -     -     -     -  Dark measurement started.
14:32:27.75  LSH      -     -     -     -  Manual scene recording started.
14:33:34.65  SWS   -6.5     -     -     -  Telescope sent to -6.000
14:33:36.86  SWS   -6.0     -     -     -  Telescope sent to -5.500
14:35:15.20  ---      -     -     -     -  *** cross sun run
14:35:44.17  ---      -     -     -     -  *** run 9 (box pattern 1)
14:37:42.08  SWS   -5.5     -     -     -  Telescope sent to -6.000
14:37:58.71  SWS   -6.0     -     -     -  Telescope sent to -6.500
14:38:27.75  SWS   -6.5     -     -     -  Telescope sent to -7.000
14:39:01.86  SWS   -7.0     -     -     -  Telescope sent to -7.500
14:40:06.64  ---      -     -     -     -  *** end of run 9
14:40:11.52  ---      -     -     -     -  *** cross sun run
14:40:18.63  SWS   -7.5     -     -     -  Telescope sent to -7.000
14:40:19.55  SWS   -7.0     -     -     -  Telescope sent to -6.500
14:40:19.98  SWS   -6.5     -     -     -  Telescope sent to -6.000
14:41:17.76  ---      -     -     -     -  *** start of run cross sun 10
14:41:21.39  SWS   -6.0     -     -     -  Telescope sent to -6.500
14:41:24.75  SWS   -6.5     -     -     -  Telescope sent to -7.000
14:42:02.95  SWS   -7.0     -     -     -  Telescope sent to -6.500
14:43:52.62  SWS   -6.5     -     -     -  Telescope sent to -6.000
14:44:29.85  SWS   -6.0     -     -     -  Telescope sent to -5.500
14:44:35.98  SWS   -5.5     -     -     -  Telescope sent to -6.000
14:46:10.43  ---      -     -     -     -  *** end of run ito sun
14:46:44.07  SWS   -6.0     -     -     -  Telescope sent to -6.500
14:46:46.10  SWS   -6.5     -     -     -  Telescope sent to -6.000
14:46:46.60  SWS   -6.0     -     -     -  Telescope sent to -5.500
14:47:56.74  ---      -     -     -     -  *** start of cross sun run
14:48:01.38  ---      -     -     -     -  *** run 11
14:49:45.94  SWS   -5.5     -     -     -  Telescope sent to -6.000
14:50:08.96  SWS   -6.0     -     -     -  Telescope sent to -5.500
14:50:50.18  SWS   -5.5     -     -     -  Telescope sent to -6.000
14:55:13.14  SWS   -6.0     -     -     -  Telescope sent to 42.000
14:55:13.59  SWS      -     -     -     -  Warning: Clipping may be occurring.
14:55:30.83  SWS      -     -    20     -  VIS int.time changed from 50ms to 20ms.
14:55:30.84  SWS      -     -     -    20  NIR int.time changed from 50ms to 20ms.
14:55:33.24  SWS      -     -     -     -  Dark measurement started.
14:55:33.93  SWS      -     -     -     -  Manual scene recording started.
14:55:35.62  SWS      -     -     -     -  Dark measurement started.
14:55:36.28  SWS      -     -     -     -  Manual scene recording started.
14:55:38.37  SWS      -     -    10     -  VIS int.time changed from 20ms to 10ms.
14:55:38.38  SWS      -     -     -    10  NIR int.time changed from 20ms to 10ms.
14:55:39.51  SWS      -     -     -     -  Dark measurement started.
```

14:55:40.05	SWS	-	-	-	-	Manual scene recording started.
14:55:40.75	SWS	-	-	-	-	Dark measurement started.
14:55:41.33	SWS	-	-	-	-	Manual scene recording started.
14:55:51.61	SWS	42.0	-	-	-	Telescope sent to 32.000
14:56:26.25	SWS	32.0	-	-	-	Telescope sent to 22.000
14:56:43.56	SWS	-	-	50	-	VIS int.time changed from 10ms to 50ms.
14:56:43.58	SWS	-	-	-	50	NIR int.time changed from 10ms to 50ms.
14:56:45.12	SWS	-	-	-	-	Dark measurement started.
14:56:46.10	SWS	-	-	-	-	Manual scene recording started.
14:56:46.94	SWS	-	-	-	-	Dark measurement started.
14:56:47.89	SWS	-	-	-	-	Manual scene recording started.
14:57:01.25	SWS	22.0	-	-	-	Telescope sent to 12.000
14:57:40.02	SWS	12.0	-	-	-	Telescope sent to 2.000
14:58:04.72	SWS	2.0	-	-	-	Telescope sent to -8.000
14:58:36.80	SWS	-8.0	-	-	-	Telescope sent to -18.000
14:59:06.91	SWS	-18.0	-	-	-	Telescope sent to -28.000
14:59:36.25	SWS	-28.0	-	-	-	Telescope sent to -38.000
14:59:55.59	SWS	-38.0	-	-	-	Telescope sent to -48.000
15:00:05.89	SWS	-	-	10	-	VIS int.time changed from 50ms to 10ms.
15:00:05.91	SWS	-	-	-	10	NIR int.time changed from 50ms to 10ms.
15:00:07.34	SWS	-	-	-	-	Dark measurement started.
15:00:07.93	SWS	-	-	-	-	Manual scene recording started.
15:00:10.79	USH	-	-	10	-	VIS int.time changed from 30ms to 10ms.
15:00:10.80	USH	-	-	-	10	NIR int.time changed from 30ms to 10ms.
15:00:12.62	USH	-	-	-	-	Dark measurement started.
15:00:13.17	USH	-	-	-	-	Manual scene recording started.
15:00:22.38	---	-	-	-	-	*** cooler at 0 deg
15:00:43.93	---	-	-	-	-	*** sza 54.5 saa 255.98
15:00:48.43	SWS	-	-	-	-	Dark measurement started.
15:00:49.04	SWS	-	-	-	-	Manual scene recording started.
15:00:50.69	USH	-	-	-	-	Dark measurement started.
15:00:51.28	USH	-	-	-	-	Manual scene recording started.
15:00:51.61	USH	-	-	-	-	Manual scene recording started.
15:00:52.62	LSH	-	-	-	-	Dark measurement started.
15:00:59.08	LSH	-	-	-	-	Manual scene recording started.
15:02:09.09	---	-	-	-	-	*** orbit 1 at 60 deg ba turn to the right
15:02:16.23	---	-	-	-	-	*** start
15:02:50.65	---	-	-	-	-	*** correction start of orbit now
15:02:54.91	LSH	-	-	-	-	Warning: Clipping may be occurring.
15:04:03.79	---	-	-	-	-	*** end of orbit 1 (actually at 55)
15:04:14.48	---	-	-	-	-	*** going for an orbit at 50 deg
15:04:22.96	---	-	-	-	-	*** start of orbit now
15:04:25.15	LSH	-	-	100	-	VIS int.time changed from 600ms to 100ms.
15:04:25.16	LSH	-	-	-	100	NIR int.time changed from 600ms to 100ms.
15:04:26.69	LSH	-	-	-	-	Dark measurement started.
15:04:28.18	LSH	-	-	-	-	Manual scene recording started.
15:04:32.07	LSH	-	-	40	-	VIS int.time changed from 100ms to 40ms.
15:04:32.08	LSH	-	-	-	40	NIR int.time changed from 100ms to 40ms.
15:04:33.73	LSH	-	-	-	-	Dark measurement started.
15:04:34.59	LSH	-	-	-	-	Manual scene recording started.
15:04:35.32	LSH	-	-	-	-	Dark measurement started.
15:04:36.22	LSH	-	-	-	-	Manual scene recording started.
15:04:38.74	USH	-	-	40	-	VIS int.time changed from 10ms to 40ms.
15:04:38.76	USH	-	-	-	40	NIR int.time changed from 10ms to 40ms.
15:04:40.37	USH	-	-	-	-	Dark measurement started.
15:04:41.27	USH	-	-	-	-	Manual scene recording started.
15:04:42.26	USH	-	-	-	-	Dark measurement started.
15:04:43.14	USH	-	-	-	-	Manual scene recording started.
15:05:16.06	---	-	-	-	-	*** end
15:05:52.62	---	-	-	-	-	*** start of orbit 2 (
15:05:56.72	---	-	-	-	-	*** 50 deg
15:07:23.34	---	-	-	-	-	*** end of orbit
15:07:23.37	SWS	-	-	-	-	Warning: Clipping may be occurring.
15:07:46.97	SWS	-48.0	-	-	-	Telescope sent to -6.000
15:07:54.57	SWS	-	-	40	-	VIS int.time changed from 10ms to 40ms.
15:07:54.58	SWS	-	-	-	40	NIR int.time changed from 10ms to 40ms.
15:07:57.93	SWS	-	-	50	-	VIS int.time changed from 40ms to 50ms.
15:07:57.95	SWS	-	-	-	50	NIR int.time changed from 40ms to 50ms.
15:08:02.81	SWS	-	-	-	-	Dark measurement started.

15:08:03.82	SWS	-	-	-	-	Manual scene recording started.
15:08:05.76	SWS	-	-	-	-	Dark measurement started.
15:08:06.82	SWS	-	-	-	-	Manual scene recording started.
15:08:09.33	LSH	-	-	600	-	VIS int.time changed from 40ms to 600ms.
15:08:09.33	LSH	-	-	-	600	NIR int.time changed from 40ms to 600ms.
15:08:11.17	LSH	-	-	-	-	Dark measurement started.
15:08:17.64	LSH	-	-	-	-	Manual scene recording started.
15:08:19.43	USH	-	-	-	-	Dark measurement started.
15:08:20.37	USH	-	-	-	-	Manual scene recording started.
15:40:06.05	USH	-	-	50	-	VIS int.time changed from 40ms to 50ms.
15:40:06.07	USH	-	-	-	50	NIR int.time changed from 40ms to 50ms.
15:40:10.62	USH	-	-	-	-	Dark measurement started.
15:40:11.61	USH	-	-	-	-	Manual scene recording started.
15:40:12.86	USH	-	-	-	-	Dark measurement started.
15:40:13.88	USH	-	-	-	-	Manual scene recording started.
15:40:48.63	---	-	-	-	-	*** flying over the alps
15:41:53.19	LSH	-	-	400	-	VIS int.time changed from 600ms to 400ms.
15:41:53.20	LSH	-	-	-	400	NIR int.time changed from 600ms to 400ms.
15:41:58.35	LSH	-	-	-	-	Dark measurement started.
15:42:02.87	LSH	-	-	-	-	Manual scene recording started.
15:42:09.35	LSH	-	-	300	-	VIS int.time changed from 400ms to 300ms.
15:42:09.36	LSH	-	-	-	300	NIR int.time changed from 400ms to 300ms.
15:42:12.86	LSH	-	-	-	-	Dark measurement started.
15:42:16.34	LSH	-	-	-	-	Manual scene recording started.
15:42:20.46	LSH	-	-	-	-	Dark measurement started.
15:42:23.95	LSH	-	-	-	-	Manual scene recording started.
15:42:25.77	LSH	-	-	-	-	Dark measurement started.
15:42:27.01	USH	-	-	-	-	Dark measurement started.
15:42:28.04	USH	-	-	-	-	Manual scene recording started.
15:42:28.58	SWS	-	-	-	-	Dark measurement started.
15:42:29.30	LSH	-	-	-	-	Manual scene recording started.
15:42:29.58	SWS	-	-	-	-	Manual scene recording started.
15:50:41.01	---	-	-	-	-	Reset shutters.
15:50:45.80	SWS	-	-	-	-	Dark measurement started.
15:50:45.81	USH	-	-	-	-	Dark measurement started.
15:50:45.89	LSH	-	-	-	-	Dark measurement started.
15:50:46.77	SWS	-	-	-	-	Manual scene recording started.
15:50:46.99	USH	-	-	-	-	Manual scene recording started.
15:50:49.66	LSH	-	-	-	-	Manual scene recording started.
15:51:09.42	---	-	-	-	-	*** profile dcent 15000 to 14500
15:53:51.48	---	-	-	-	-	*** start of run
15:54:10.40	---	-	-	-	-	*** run 14
15:59:22.47	---	-	-	-	-	*** end of run
16:16:46.83	SWS	-	-	-	-	Dark measurement started.
16:16:47.81	SWS	-	-	-	-	Manual scene recording started.
16:16:49.25	USH	-	-	-	-	Dark measurement started.
16:16:50.24	USH	-	-	-	-	Manual scene recording started.
16:16:53.62	LSH	-	-	-	-	Dark measurement started.
16:16:57.08	LSH	-	-	-	-	Manual scene recording started.
16:16:59.53	SWS	-	-	-	-	Dark measurement started.
16:17:00.53	SWS	-	-	-	-	Manual scene recording started.
16:17:03.23	USH	-	-	-	-	Dark measurement started.
16:17:04.23	USH	-	-	-	-	Manual scene recording started.
16:17:06.24	LSH	-	-	-	-	Dark measurement started.
16:17:09.73	LSH	-	-	-	-	Manual scene recording started.
16:20:44.79	---	-	-	-	-	*** cooler at 1 deg
16:23:48.57	---	-	-	-	-	*** cooler at 2 deg
16:30:00.01	---	-	-	-	-	*** cooler at 3 deg
16:37:36.93	---	-	-	-	-	*** cooler at 2 deg
17:03:18.43	---	-	-	-	-	*** cooler was at 0 deg during piroeutte 2
17:03:28.83	SWS	-	-	-	-	Telescope disabled.

Wet Nephelometer Log

Flight No **B**..367..... Date ...9/5/08 Operator's name: …J.Bowles Page ...1... of .....

GMT	Run	Height	Sample flow	Dry neph RH	Wet neph RH	Temp ramp	T_{water}	Remarks
123827						49		Aim for 85% start
124020	r1	3800			81.9	19		
124353	r1	3800	15.6	21	55	49		Quick ramp as short runs
124910	r1			19.7	85			try maintain 85% for profile down
125700	r?	9000	14.9	0	88	19		little aerosol
130410	r2	9000	15.0	0	37	49		quick ramp, short run. No sig data
130420								missed end of run, carry on for 85%
130700	r3	9000						short run still aim for 85%
1328ish						17		
133000		3900	15	22	85	17		try again, chiller lock up!
133611		3900	15	20	53	47		extended run
134355		10000	14.8	0	90	47		chiller off
								Rest of flight above 10000ft.

Flight: B367

KEY

- Not Fitted
- Fitted, Not Operated
- Duff Data
- Minor Problems
- OK

Thermometers
- Cabin Temperature:
- Heimann:
- Deiced Temp:
- Non-deiced Temp:

Hygrometers
- FWVS:
- Buck CR2:
- General Eastern:
- Johnson Williams:
- Nevzorov:
- Total Water Probe:

Cameras
- Downward Facing:
- Forward Facing:
- Rearward Facing:
- Upward Facing:

Navigation + Aircraft
- Cruciform GPS:
- GIN Applanix:
- INU Honeywell:
- Radar Altimeter:
- RVSM IAS:
- RVSM Static Pressure:
- XR5 GPS:

Misc Core
- AMTG:
- AVAPS:
- Cabin Pressure:
- Fax machine:
- Printer:
- S9 Static Pressure:
- Satcom C:
- Satcom H:
- Turb Centre-Static:
- Turb Left Right:
- Turb Up-Down:
- Turb Horizontal Chk:
- Turb Vertical Chk:
- Weather Radar:

DLUs:
- DLU AERACK:
- DLU BBR Lower:
- DLU BBR Upper:
- DLU Core Chem:
- DLU Core Consoles:
- DLU Port Aft:
- DLU Port Fwd:
- DLU Stbd Fwd:

Radiometers
Lower:
- BBR (clear) Lower:
- BBR (IR) Lower:
- BBR (red) Lower:

Upper:
- BBR (clear) Upper:
- BBR (IR) Upper:
- BBR (red) Upper:

- ARIES:
- DEIMOS:
- IR Camera:
- JNO2 Lower:
- JNO2 Upper:
- JO1D Lower:
- JO1D Upper:
- MARSS:
- SHIMS Lower:
- SHIMS Upper:
- SWS:
- TAFTS:

Cloud Probes
- 2DC:
- 2DP:
- FFSSP:
- PCASP:
- 2DS:
- ADA:
- CAPS:
- CCN:
- CDP:
- CIP 100:
- CIP 25:
- CPI:
- CVI:
- SID1:
- SID2:

Aerosol
- CPC 3025A:
- CPC 3786 H2O:
- Filters 47mm:
- Filters 90mm:
- Neph - Dry:
- Neph - Wet:
- PSAP:
- AMS:
- CPC 3025 (AMS)
- INC:
- VACC:
- CPC 3010A (CVI):
- SP2:
- UHSAS:

Chemistry
- CO Aerolaser 5002:
- NOx TE42C:
- Ozone TE49C:
- Ozone TE49:
- SO2 TE43C:
- TDLAS (NIR) CH4:
- TDLAS (NIR) CO2:
- FAGE:
- Formaldehyde:
- NOx FAAM:
- NOxy:
- ORAC:
- PAN:
- PERCA:
- Peroxide:
- PTRMS:
- TDLAS (1C):
- WAS Bags:
- WAS Bottles:

Misc Non-Core
- CASI/ATM:
- LIDAR:
- LTI:
- SAW Hygrometer:

Report Created 20/05/2008 09:47:23

Last Updated: 10/05/2008 07:27:32

Faults / Incidents Log

Flight No. B367
Date: 09 May 2008

Instruments

1. INU – not run
2. FFC Window – lots of smudges, will require cleaning on return to base.
3.

Instrument Status roundup

Aircraft

Nil

ISDN Emails

Nil

Satcom-H Calls

Nil

Issues

Post Flight - Turb Probe Water Traps

1. Indicate Amount of Water: a) Nil b) 1-2 drops c) ¼ full or more d) Ice present
2. Emptied by:
3. Dried by

MISSING LOG SHEETS:

The following log sheets are not available for flight B367:

Log	Reason
Pre-flighter log	No log available
Core Chemistry / TDLAS	no In Flight log except in cases of instrument problems
Filters	Awaiting confirmation of whether a log was created – Keith Bower
2D-S / CAPS / CPI	2D-S / CAPS / CPI operator does not create a log sheet
AMS log	AMS operator does not create a log sheet
CVI	No log as CVI was only operated on three flights : B376, B377 & B378
PAN	Operator does not create a log sheet
CCN	CCN operator does not create a log sheet

Document control

Revision	Date	Author	Comments
r0	24 Jul 2008	Doug Anderson	Initial version missing the above noted logs
r1			
r2			

VIDEO RECORDINGS:

3 x Forward Facing Cameras
3 x Upward Facing Cameras

Further digital video recordings in avi format:

faam-video-dfc_faam_20080509_b367_123552_1hz.avi
faam-video-dfc_faam_20080509_b367_133552_1hz.avi
faam-video-dfc_faam_20080509_b367_143552_1hz.avi
faam-video-dfc_faam_20080509_b367_145754_1hz.avi
faam-video-dfc_faam_20080509_b367_155754_1hz.avi

faam-video-rfc_faam_20080509_b367_123544_1hz.avi
faam-video-rfc_faam_20080509_b367_133544_1hz.avi
faam-video-rfc_faam_20080509_b367_143544_1hz.avi
faam-video-rfc_faam_20080509_b367_145754_1hz.avi
faam-video-rfc_faam_20080509_b367_155754_1hz.avi

faam-video-ffc_faam_20080509_b367_123541_1hz.avi
faam-video-ffc_faam_20080509_b367_133541_1hz.avi
faam-video-ffc_faam_20080509_b367_143541_1hz.avi
faam-video-ffc_faam_20080509_b367_145754_1hz.avi
faam-video-ffc_faam_20080509_b367_155754_1hz.avi

faam-video-ufc_faam_20080509_b367_123548_1hz.avi
faam-video-ufc_faam_20080509_b367_133548_1hz.avi
faam-video-ufc_faam_20080509_b367_143548_1hz.avi
faam-video-ufc_faam_20080509_b367_145754_1hz.avi

Digital8 video recordings from this flight reside with :

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